

REMARKS

Claims 1, 3, 5, 11, 14 and 17 have been amended. Claims 4, 8-10, 12 and 18 have been canceled. Reexamination and reconsideration of the remaining pending claims, i.e., claims 1-3, 5-7, 11, 13-17, and 19-22, are respectfully requested.

Initially, Applicants gratefully acknowledge the indicated allowability of dependent claims 3 and 14 if rewritten into independent form. Accordingly, Applicants have amended claims 3 and 14 into independent form and those claims are now in condition for allowance.

Applicants have canceled method claims 8-10.

In the Office Action, independent claims 1, 11 and 17 were rejected as obvious over SAKAMOTO et al. (US 6,396,229) in view of SUGIURA et al. (US 4,922,175) and LEE (US 6,283,252). Applicants respectfully traverse this rejection in view of the clarifying amendments made to independent claims 1, 11 and 17 along with the following remarks.

Applicants' claimed invention is directed toward controllers (independent claims 1 and 17) and a mobile body system (independent claim 11) that advantageously make it possible to control the position of a mobile body by estimating based upon a magnetic pole position of a rotor of the synchronous motor in accordance with electrical quantities. The invention makes it possible to highly accurately control the position by correcting the estimated position of the mobile body based on absolute position information of the mobile body (see,

for example, paragraph 11). Moreover, Applicants' claimed invention makes use of a position information correction unit which corrects the position of the mobile body estimated by the mobile body position estimator based on an absolute position information of the mobile body before the mobile body stops its movement (see, for example paragraphs 21 and 33-34).

Applicants' independent claims 1, 11 and 17 each include a rotor position estimator, a mobile body position estimator and a position information correction unit. In that regard, Applicants have amended these claims to note that the mobile body position estimator estimates the position of the mobile body from the estimated magnetic pole position and an initial value of the position of the mobile body. Applicants have further specified that a position information correction unit corrects the position of the mobile body estimated by the mobile body position estimator based on an absolute position information of the mobile body before the mobile body stops.

Hence, in Applicants' invention, the magnetic pole position of the rotor of the synchronous motor is estimated based on an electric value relating to the electric power supplied to the synchronous motor, and the mobile body position is estimated based on the estimated rotor position. In other words, the mobile body position is actually estimated based on the electric value relating to the electric power supplied to the synchronous motor. As such, contrary to the prior art, Applicants' mobile body position may be estimated without using any special

sensor that measures the magnetic pole position or the position of the mobile body.

Moreover, Applicants now recite the position information correction unit which corrects the position of the mobile body estimated by the mobile body position estimator based on absolute position information of the mobile body. As a result, Applicants' invention is able to highly accurately estimate the position of the mobile body.

In contrast, SAKAMOTO '229 merely discloses an "axis shift error compensator" (reference numeral 7 in Figure 1) for correcting an axis shift $\Delta \theta$ (see Figure 2) between the d-axis showing the direction of the magnetic flux of the permanent magnet rotor and the dc-axis showing a virtual rotator position. However, in contrast to the Examiner's assertions that the axis-shift error compensator 7 corresponds to Applicant's claimed position information correction unit, that is certainly not the case here. Applicants' position information correction unit corrects the position of the mobile body estimated by the mobile body position estimator based on an absolute position information of the mobile body before the mobile body stops. No where does SAKAMOTO correct for the position of the mobile body based on absolute position information of the mobile body before the mobile body stops.

Moreover, the Examiner has already pointed out in the Office Action that SAKAMOTO does not "disclose controlling a mobile body via a mobile body position estimator" (see Office Action, page 3, lines 4-5). In order to overcome this

deficiency, the Examiner cites to SUGIURA '175. However, SUGIURA merely discloses a "two-phase encoder" for finely detecting an estimated position. In SUGIURA, the "two-phase encoder" includes a sensor for detecting the rotational angle of the rotational axis of the electric motor, wherein a two-phase signwave signal is output according to the rotational angle.

The "position detector original signal 1" shown in Fig. 1 of SUGIURA et al. is a two-phase signwave signal $\sin A$, $-\cos B$, and "position detector" corresponds to the two-phase encoder. Thus, it is apparent to one skilled in the art that these signals mean the rotational angles. Put in other words, SUGIURA et al. fails to show any construction of the "the mobile body position estimator" of the present invention.

Furthermore, as the rotational angle is detected as shown in SUGIURA et al., it is apparent that "position correction circuit 19" shown in Fig. 1 is a circuit for correcting the rotational angle. Therefore, SUGIURA et al likewise fails to disclose "the position information correction unit", which corrects the position of the mobile body estimated by the mobile body position estimator based on absolute position information of the mobile body before the mobile body stops.

In view of the above, neither SAKAMOTO nor SUGIURA disclose, teach or suggest the features of the present invention, as claimed, with respect to the mobile body position estimator and the position information correction unit. Thus, Applicants submit independent claims 1, 11 and 17, as amended, are now in condition for allowance.

Moreover, claims 2, 5-7, 13, 15-16 and 19-22 depend, respectively, from one of these independent claims and are also submitted to be in condition for allowance.

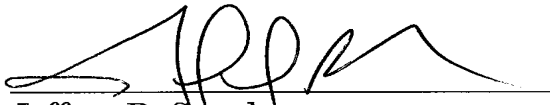
In view of the foregoing, Applicants submit all of the pending claims are now in condition for allowance. An early notice to that effect is solicited.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #056207.50449US).

Respectfully submitted,

January 8, 2007


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